

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Warren Cope
Application No.: 09/998,569
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Group No.: 2623
Examiner: David R. O'Steen

For: Video System For Use Where The Network Transfer Rate Is Slower Than The
Video Display Rate

Mail Stop: Appeal Brief-Patents
Commissioner for Patents
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Appeal Brief

Real Party in Interest

Sprint Communications Company, L.P. is the real party in interest.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 6, 21, and 36 have been cancelled. Claims 1-5, 7-20, 22-35, and 37-45 are pending under a final rejection. Claims 1-5, 7-20, 22-35, and 37-45 are the claims on appeal.

Status of Amendments

No amendments have been filed subsequent to the final rejection.

Summary of the Claimed Subject Matter

Claim 1 describes a video system 103 that comprises network interface 221, memory 224, processing system 222, and video interface 223 (see the Application, page 6, lines 19-21). Network interface 221 receives a network signal that includes video from communication network 102 (see the Application, page 7, lines 1-2 and 7-14). Memory 224 stores the video from the network signal (see the Application, page 7, lines 2-3, 7-11, and 19-21). Video interface 223 transfers a video signal that includes the video to video display 104 (see the Application, page 7, lines 3-4, lines 7-11, and lines 16-19). Processing system 222 determines when to initiate the transfer of the video signal from video interface 223 (see the Application, page 7, lines 5-11 and 14-16; and page 9, lines 3-22). The determination is based on a first time period and a second time period (see the Application, page 9, lines 3-22). The first time period is determined based on the video display rate times a first amount of the video in memory 224 (see the Application, page 9, lines 3-22). The second time period is determined based on a network transfer rate times a second amount of the video to be subsequently received in the network signal (see the Application, page 9, lines 3-22).

Claim 16 describes a method of operating video system 103 (see the Application, page 6, line 19). Video system 103 receives a network signal that includes video from communication network 102 (see the Application, page 7, lines 1-2). Video system 103 stores the video from the network signal in memory 224 (see the Application, page 7, lines 2-3). Video system 103 transfers a video signal that includes the video to video display 104 (see the Application, page 7, lines 3-4). Video system 103 determines when to initiate the transfer of the video signal to video display 104 (see the Application, page 7, lines 5-6 and page 9, lines 3-22). The determination is based on a first time period and a second time period (see the Application, page 9, lines 3-22). The first time period is determined based on the video display rate times a first amount of the video in memory 224 (see the Application, page 9, lines 3-22). The second time period is determined based on a network transfer rate times a second amount of the video to be subsequently received in the network signal (see the Application, page 9, lines 3-22).

Claim 31 describes a software product for video system 103. Video system 103 comprises network interface 221, memory 224, processing system 222, and video interface 223 (see the Application, page 6, lines 19-21). Network interface 221 receives a network signal that includes video from communication network 102 (see the Application, page 7, lines 1-2 and 7-14). Memory 224 stores the video from the network signal (see the Application, page 7, lines 2-3, 7-11, and 19-21). Video interface 223 transfers a video signal that includes the video to video display 104 (see the Application, page 7, lines 3-4, lines 7-11, and lines 16-19). The software product comprises memory 224 that stores application software 226. Application software 226 directs processing system 224 to operate as follows (see the Application, page 7, lines 5-11 and 14-16; and page 8, lines 1-7). Processing system 222 determines when to initiate the transfer of the video signal from video interface 223 (see the Application, page 7, lines 5-11 and 14-16, and page 9, lines 3-22). The determination is based on a first time period and a second time period (see the Application, page 9, lines 3-22). The first time period is determined based on the video display rate times a first amount of the video in memory 224 (see the Application, page 9, lines 3-22). The second time period is determined based on a network transfer rate times a second amount of the video to be subsequently received in the network signal (see the Application, page 9, lines 3-22).

Grounds of Rejection to be Reviewed on Appeal

1. Whether claims 1-5, 7-11, 13-14, 16-20, 22-26, 28-29, 31-35, 37-41, and 43-44 are unpatentable under 35 U.S.C. §103(a) over the Gross reference (Gross) in view of U.S. Patent 6,175,871 (Schuster).
2. Whether claims 12, 15, 27, 30, 42, and 45 are unpatentable under 35 U.S.C. §103(a) over the Gross reference (Gross) in view of U.S. Patent 6,175,871 (Schuster) and U.S. Patent 6,157,377 (Shah-Nazaroff).

Argument

Rejection #1 – Claim Group #1: Claims 1, 3-5, 7, 10-11, 13-14, 16, 18-20, 22, 25-26, 28-29, 31, 33-35, 37, 40-41, and 43-44.

Claim 1 requires a video system that receives and stores video from a communication network. The video system determines when to initiate display of the stored video based on a first time period and a second time period. The first time period is based on “the video display rate times a first amount of the video in the memory.” The second time period is based on “a network transfer rate times a second amount of the video to be subsequently received.” Thus, the claimed invention accounts for both the *network transfer rate* and the *video display rate* to determine when to initiate the display of the stored video.

Advantageously, the invention can account for large differences between the video display rate and the network transfer rate by storing enough video before initiating the video display. Thus, after waiting for a minimized time period, the user may watch a high definition movie (high display rate) that is being downloaded over a DSL Internet link (slow network transfer rate). The invention can provide a higher-quality video over lower-quality network connections

The cited prior art (Gross and Schuster) teach control techniques for jitter buffers. Jitter buffers are small memories that are used for streaming video where the network transfer rate is approximately the same as the video display rate. The video server streams the video over the network to the jitter buffer. The jitter buffer stores a few seconds or milliseconds of video before playback, but the jitter buffer essentially plays out the video as it is received. If a video packet is a second late, a continuous video

stream may still be played out of the jitter buffer. If the video packet is a few minutes late, the jitter buffer would starve, and a gap in video playback would result. As is well known in the art, jitter buffers are used to smooth out small network delays by buffering a few seconds or milliseconds of video. Jitter buffers are not suitable when the network transfer rate is much smaller than the video display rate, because the small buffers would continually starve. In contrast, the invention is designed for a network transfer rate that is smaller than the video display rate.

Gross does **not** initiate video playback based on the network transfer rate and the video display rate as claimed. Gross sets the amount of video to buffer before playback at the memory size, but allows the user to select the number of “seconds” of video to buffer before playback (see Gross p. 65). Thus, Gross initiates video playback based on a default setting or a user selection. Gross initiates video playback *without any regard* to the network transfer rate or the video display rate.

In Gross, the video player transfers the expected network transfer rate to the video server (RealServer). The RealServer matches the video coding rate to the expected network transfer rate to match the video quality to the network connection quality (see Gross p. 51). Thus, the RealServer transfers higher-quality video over higher-quality network connections, but the RealServer transfers lower-quality video over lower-quality network connections. In direct contrast, the claimed invention would support the higher-quality video over the lower-quality network connection.

Schuster does **not** initiate video playback based on the network transfer rate and the video display rate as claimed. Schuster teaches a video buffer that is sized based on packet loss (see Schuster, column 11, lines 39-64). In Schuster, the buffer size is

measured in milliseconds (see Schuster column 10, lines 45-46). Thus, Schuster delays video playback for an amount of milliseconds that varies based on packet loss. The use of a millisecond buffer that is sized based on packet loss is quite different from a system that initiates video display based on the network transfer rate and the video display rate.

Note that the *millisecond* buffer in Schuster requires that the network transfer rate be approximately the same as the video display rate to avoid continuous buffer starvation or overflow. Thus, Schuster does not support higher-quality video being delivered over lower-quality network connections. In direct contrast, the claimed invention would support the higher-quality video over the lower-quality network connection.

Both Gross and Schuster teach techniques for *jitter buffers* – small buffers that smooth out video playback by storing a few seconds or milliseconds of video. Jitter buffers are used where network transfer rates are approximately the same as video display rates. It appears clear that one skilled in the art would not modify a jitter buffer to arrive at the invention. The jitter buffers in Gross and Schuster are not suited to carry out the claimed invention, and their modification to arrive at the invention would appear to be based on improper hindsight reasoning.

The above argument also applies to claims 3-5, 7, 10-11, 13-14, 16, 18-20, 22, 25-26, 28-29, 31, 33-35, 37, 40-41, and 43-44.

Rejection #1 – Claim Group #2: Claims 2, 17, and 32

Claim 2 requires that the video system “determine the network transfer rate based on an initial amount of the video received in the network signal and a time period to receive the initial amount of the video.” Thus, the claimed video system dynamically and

accurately determines the network transfer rate that is used to control video playback.

Neither Gross nor Schuster use the network transfer rate for playback control.

The same argument applies to claims 17 and 32.

Rejection #1 – Claim Group #3: Claims 8, 23, and 38

Claim 8 requires that the claimed video system initiate the video transfer when the video can be “viewed to completion with one intermission”. Neither Gross nor Schuster mention an “intermission” for playback control. Accounting for an “intermission” to control video playback does not make sense for the small jitter buffers used in Gross and Schuster that store only a few seconds or milliseconds of video.

The same argument applies to claims 23 and 38.

Rejection #1 – Claim Group #4: Claims 9, 24, and 39

Claim 9 requires that the claimed video system initiate the video transfer when a “user-selected portion of the video can be viewed to completion without intermission.” Neither Gross nor Schuster mention user selection of a portion of video to control when to initiate playback. For example, the user may only want to watch the first half of a movie, so in the claimed invention, the video display could start sooner than if the entire movie were viewed. Accounting for a “user-selected portion of the video” to control video playback does not make sense for the small jitter buffers used in Gross and Schuster that store only a few seconds or milliseconds of video.

The same argument applies to claims 24 and 39.

Rejection #2 – Claim Group #1: Claims 12, 15, 27, 30, 42, and 45

Claims 12, 15, 27, 30, 42, and 45 are dependent on independent claims 1, 16, and 31 and are patentable for the reasons given above.

Claims Appendix

The claims under appeal follow below:

1. A video system comprising:

a network interface configured to receive a network signal from a communication network wherein the network signal includes video;

a memory configured to store the video from the network signal;

a video interface configured to transfer a video signal to a video display wherein the video signal includes the video from the memory; and

a processing system configured to determine when to initiate the transfer of the video signal from the video interface based on a first time period and a second time period wherein the first time period is determined based on the video display rate times a first amount of the video in the memory and the second time period is determined based on a network transfer rate times a second amount of the video to be subsequently received in the network signal.

2. The video system of claim 1 wherein the processing system is configured to determine the network transfer rate based on an initial amount of the video received in the network signal and a time period to receive the initial amount of the video.

3. The video system of claim 1 wherein the processing system is configured to initiate the transfer of the video signal when the first time period is equal to the second time period.

4. The video system of claim 1 wherein the processing system is configured to initiate the transfer of the video signal when the first time period is greater than the second time period.

5. The video system of claim 1 wherein the first amount of the video in the memory includes a previously received and displayed portion of the video.

7. The video system of claim 1 wherein the processing system is configured to initiate the transfer of the video signal when the video can be continuously viewed to completion without intermission and before all of the video is received in the network signal.

8. The video system of claim 1 wherein the processing system is configured to initiate the transfer of the video signal when the video can be viewed to completion with one intermission and before all of the video is received in the network signal.

9. The video system of claim 1 wherein the processing system is configured to initiate the transfer of the video signal when a user-selected portion of the video can be viewed to completion without intermission and before all of the video is received in the network signal.

10. The video system of claim 1 wherein the processing system is configured to transfer a menu signal to the video display to display a user selection menu.

11. The video system of claim 10 wherein the user selection menu indicates a plurality of available videos for viewing on-demand and the user selection selects the video from the available videos.

12. The video system of claim 11 wherein the user selection menu indicates a plurality of available video display rates and the user selection selects the video display rate from the available video display rates.

13. The video system of claim 11 wherein the user selection menu indicates a time remaining before the transfer of the video signal will initiate.

14. The video system of claim 11 wherein the user selection menu provides a notice when the transfer of the video signal is initiating

15. The video system of claim 1 wherein the video signal is configured as a channel for a satellite system video decoder.

16. A method of operating a video system, the method comprising:

receiving a network signal from a communication network wherein the network signal includes video;

storing the video from the network signal in a memory;

determining when to initiate transfer of a video signal including the video from the memory based on a first time period and a second time period wherein the first time period is determined based on the video display rate times a first amount of the video in the memory and the second time period is determined based on a network transfer rate times a second amount of the video to be subsequently received in the network signal; and

transferring the video signal to a video display in response to determining when to initiate the transfer.

17. The method of claim 16 further comprising determining the network transfer rate based on an initial amount of the video received in the network signal and a time period to receive the initial amount of the video.

18. The method of claim 16 wherein determining when to initiate the transfer comprises initiating the transfer of the video signal when the first time period is equal to the second time period.

19. The method of claim 16 wherein determining when to initiate the transfer comprises initiating the transfer of the video signal when the first time period is greater than the second time period.

20. The method of claim 16 wherein the first amount of the video in the memory includes a previously received and displayed portion of the video.

22. The method of claim 16 wherein determining when to initiate the transfer comprises determining when the video can be continuously viewed to completion without intermission and before all of the video is received in the network signal.

23. The method of claim 16 wherein determining when to initiate the transfer comprises determining when the video can be viewed to completion with one intermission and before all of the video is received in the network signal.

24. The method of claim 16 wherein determining when to initiate the transfer comprises determining when a user-selected portion of the video can be viewed to completion without intermission and before all of the video is received in the network signal.

25. The video system of claim 1 further comprising transferring a menu signal to the video display to display a user selection menu.

26. The method of claim 25 wherein the user selection menu indicates a plurality of available videos for viewing on-demand and the user selection selects the video from the available videos.

27. The method of claim 26 wherein the user selection menu indicates a plurality of available video display rates and the user selection selects the video display rate from the available video display rates.

28. The method of claim 26 wherein the user selection menu indicates a time remaining before the transfer of the video signal will initiate.

29. The method of claim 26 wherein the user selection menu provides a notice when the transfer of the video signal is initiating

30. The method of claim 16 wherein transferring the video signal comprises configuring the video signal as a channel for a satellite system video decoder.

31. A software product for a video system comprising a processing system, a network interface that receives a network signal from a communication network wherein the network signal includes video, a memory that stores the video from the network signal, a video interface that transfers a video signal to a video display wherein the video signal includes the video from the memory, the software product comprising:

application software configured to direct the processing system to determine when to initiate the transfer of the video signal from the video interface based on a first time period and a second time period wherein the first time period is determined based on the video display rate times a first amount of the video in the memory and the second time period is determined based on a network transfer rate times a second amount of the video to be subsequently received in the network signal; and

the memory that stores the application software.

32. The software product of claim 31 wherein the application software directs the processing system to determine the network transfer rate based on an initial amount of the video received in the network signal and a time period to receive the initial amount of the video.

33. The software product of claim 31 wherein the application software directs the processing system to initiate the transfer of the video signal when the first time period is equal to the second time period.

34. The software product of claim 31 wherein the application software directs the processing system to initiate the transfer of the video signal when the first time period is greater than the second time period.

35. The software product of claim 31 wherein the first amount of the video in the memory includes a previously received and displayed portion of the video.

37. The software product of claim 31 wherein the application software directs the processing system to initiate the transfer of the video signal when the video can be continuously viewed to completion without intermission and before all of the video is received in the network signal.

38. The software product of claim 31 wherein the application software directs the processing system to initiate the transfer of the video signal when the video can be viewed to completion with one intermission and before all of the video is received in the network signal.

39. The software product of claim 31 wherein the application software directs the processing system to initiate the transfer of the video signal when a user-selected portion of the video can be viewed to completion without intermission and before all of the video is received in the network signal.

40. The software product of claim 31 wherein the application software directs the processing system to transfer a menu signal to the video display to display a user selection menu.

41. The software product of claim 40 wherein the user selection menu indicates a plurality of available videos for viewing on-demand and the user selection selects the video from the available videos.

42. The software product of claim 40 wherein the user selection menu indicates a plurality of available video display rates and the user selection selects the video display rate from the available video display rates.

43. The software product of claim 40 wherein the user selection menu indicates a time remaining before the transfer of the video signal will initiate.

44. The software product of claim 40 wherein the user selection menu provides a notice when the transfer of the video signal is initiating

45. The software product of claim 31 wherein the video signal is configured as a channel for a satellite system video decoder.

Evidence Appendix

There is no additional evidence.

Related Proceedings Appendix

There are no related proceedings.

Respectfully submitted,

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SIGNATURE OF PRACTITIONER

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